Home Care Referral and Aide Time Tracking
TOP Grant Number 53-60-98015

Project Evaluation

Homecare Aide Time Tracking

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Executive Summary

In October of 1998 Aging and Disability Services (ADS) received a three year Technology Opportunities Program grant for $410,000 from the U.S. Department of Commerce. Our goal was to ***improve the efficiency and quality of home care services*** in King County by developing an automated system to refer clients and to track home care aide service hours**.**

Between 1998 and 2002 ADS designed and launched Home Care Referral (HCR) and Home Care Aide Time Tracking (HCATT) to address several systemic problems in the home care field. HCR enables case management agencies, ADS, and up to 16 home care agencies to become an interactive network utilizing a distributed database infrastructure to initiate and respond to home care referrals. HCATT is used by home care aides to call in at the beginning and end of each service visit to a client's home.

The project evaluation consists of two parts: a process evaluation and an outcome evaluation. Our process evaluation showed mixed results: HCR was launched according to our project timeline, but our HCATT tasks slipped by an average of 13 months. The two major lessons we learned were: each project module required a full two years to implement; and we needed twice the user support specialist capacity to adequately address the varying needs of so many types of users.

The major findings of the outcome evaluation were:

1. HCR was successful in improving the **efficiencies** in the process of case manager's referrals to home care agencies. Case managers using HCR took an average of 53 minutes per referral versus the baseline average of 93 minutes.
2. **Cost savings** of .25 FTE per year can be attributed to the improved referral process.
3. The **quality of service** improved during the project as measured by the reduction in time between the referral and the initial start of services to the client. Surveys of case managers in 2002 indicated that 82.5% of case managers reported that it took 6 days or less from referral to service startup compared with 59.3% in 2002.
4. ADS managers and contract specialists report that they are more effective in increasing **accountability** due to the ease of use and availability of market trend and agency performance data. HCR and market share data point to a strengthening relationship between data and decisions. Agencies with the highest referral acceptance rate tended to have the highest gains in market share.
5. Due to the delayed implementation of HCATT, we are unable at this time to document the projected cost savings of .25 FTE for the home care billing process, or to report on the usefulness and ease of use of HCATT from the home care agency staff and home care aide perspective.

A positive result that we did not anticipate at the outset of the project was the ongoing local funding from the City of Seattle Department of Information Technology for HCATT's share of the City's interactive voice response infrastructure. The local funding is double because it leverages equal funding federal match from Medicaid.

Project Background

In October of 1998 Aging and Disability Services (ADS) sought to ***improve the efficiency and quality of home care services*** in King County by developing an automated system to refer clients and to track home care aide service hours. Each year home care agencies in King County provide assistance to over 2,000 low-income people who need help with essential life functions such as bathing, dressing, eating, toileting, and managing medications. Aging and Disability Services (the local area agency on aging) in partnership with case management agencies and home care agencies is responsible for funding, administering, authorizing, and delivering these services. All partners seek to provide effective services to allow fragile individuals served to remain at home as long as possible, the first choice for most families. However, setting up a plan to make this happen is no small task.

ADS designed and launched Home Care Referral (HCR) and Home Care Aide Time Tracking (HCATT) to address several systemic problems in the home care field:

1. Referral sources were unable to make "good" referrals; other than word-of-mouth, there was no practical way to know in advance which providers had the best current track record.
2. Making a referral was time-consuming and inefficient. Case managers made multiple phone calls to various homecare agencies in search of a worker who could provide services on the schedule most beneficial to the client and family. The only way case management programs and agencies could share client information was through fax transmission of multi-page documents.
3. There was no feedback loop to let case managers know promptly when clients would first be served (or even whether the referral was accepted).
4. Agencies sometimes delayed in reporting gaps in service to the client's case manager
5. Agencies did not get prompt feedback about poor performance.
6. Agencies and ADS finance staff spent many hours each month preparing invoices for prompt reimbursement.

HCR enables case management agencies, ADS, and up to 16 home care agencies to become an interactive network utilizing a distributed database infrastructure to: 1) initiate and respond to home care referrals, and 2) build a real-time performance profile database so that case managers can refer to the highest performing agencies. HCATT is used by home care aides to call in at the beginning and end of each service visit to a client's home. The service visit data is fed to billing and payroll systems reducing time spent on billing processes. In addition case managers can see actual hours served in real time for each of their clients thus improving the quality and timeliness of home care services.

The HCR/HCATT evaluation design consists of two components: a process evaluation and an outcome evaluation. The first focused on whether or not the project achieved the following objectives in a timely manner: 1) to implement a Web-based system (HCR) for initiating and responding to home care referrals which builds a real-time performance profile database to improve home care quality and accountability; and 2) to develop and implement a home care aide time tracking system (HCATT) to improve consistency of home care services and streamline agency payroll and billing.

The outcome evaluation assessed whether or not the project accomplished the goal of improving the quality and efficiency of the home care system.

Process Evaluation

Our process evaluation consisted of comparing the original due date with the actual completion date for each set of project tasks related to the implementation of HCR and HCATT (Table 1). HCR, the first module to be developed, was designed and launched according to the project timeline with an average difference of 1.8 months between task due dates and completion dates.

The development of the second module, HCATT, slipped significantly with an average difference of 13 months between task due dates and completion dates. ADS had less control over the HCATT timeline due to our required reliance on an outside subcontractor who developed the interactive voice response (IVR) modules. There were significant delays in the completion of the IVR modules resulting in the delay of the HCATT system implementation.

Table 1. Project Timeline 1999 - 2002

Project Category	Task	Original Due Date	Completion Date	Months Difference
HCR	Design home care referral system	3 / 1999	3 / 1999	0
HCR	Develop home care referral user training plan	3 / 1999	3 / 1999	0
HCR	Write home care referral user documentation	8 / 1999	11 / 1999	3
HCR	Implement home care referral system	9 / 1999	12 / 1999	3
HCR	Train home care referral system users	9 / 1999	12 / 1999	3
	HCR average difference			**1.8 months**
HCATT	Design home care aide time tracking system	8 / 1999	8 / 2000	12
HCATT	Develop home care aide time tracking user training plan	8 / 1999	3 / 2000	7
HCATT	Write home care aide time tracking user documentation	4 / 2000	12 / 2000	8
HCATT	Implement home care aide time tracking system	7 / 2000	2 / 2002	19
HCATT	Train home care aide time tracking system users	7 / 2000	2 / 2002	19
	HCATT average difference			**13 months**

The lessons we learned from the process included:

1. While the two systems were tied together conceptually, they each required different sets of technical expertise to implement. We needed more time to fully develop all reporting functions and to incorporate new functional requests into HCR before embarking on the design of HCATT.
2. We should have added twelve months to the project timelines given our reliance on outside contractors to complete the work for HCATT.
3. We needed at least a full-time user support specialist (rather than a half-time position) given the varying needs of so many types of users (case managers, home care agency supervisors, home care aides), the number of languages required (six minimum), the volume of users (120 case managers, 1,500+ home care aides, 20-30 supervisors), and the retraining required due to staff turnover.

Outcome Evaluation

The outcome evaluation examined the project impact on clients, case managers, home care agency supervisors, and home care workers. First, data were collected via phone interviews from clients and home care supervisors, by email from case managers, and by mailed surveys from home care aides. Second, market share data was extracted from the ADS billing database. Finally, the HCR performance reporting system was used to gather data regarding home care agency performance.

The five anticipated project outcomes were:

1. **Improved efficiencies** in the process of case managers' referrals to home care agencies
2. **Reduced costs** due to staff time saved in key administrative processes
3. **Improved quality of service** for clients, including faster initiation of service and more dependable service
4. **Increased accountability** of contracted home care workers and provider agencies
5. **Increased satisfaction** with service quality and efficiency by consumers, case managers, and other providers

Improved Efficiencies

Before HCR was implemented, making a referral was time-consuming and inefficient. Case managers made multiple phone calls to various homecare agencies in search of a worker who could provide services on the schedule most beneficial to the client and family. The only way case management programs and agencies shared client information was through fax transmission of multi-page documents.

The results of the evaluation show that *case managers who are using HCR use markedly fewer minutes to complete a referral than case managers using the old phone/fax system*. In 1999 case manager surveys showed that it took an average of 96 minutes to make a referral to home care (Table 2). The 2000 case manager surveys showed an increase to an average of 116 minutes. By 2001, a full year after the implementation of HCR, the average number of minutes per referral dropped to 53. In 2002 case managers using HCR averaged 59 minutes while those still using the phone/fax referral averaged 81 minutes.

Table 2. Time to make referrals 1999 - 2002

	1999	2000	2001	2002	2002
How much time (in minutes) do you spend making a referral to home care?	N=56	N=58	N=7	N=7 using HCR	N=16 using Phone/Fax
Average	96	116	53	59	81
Median	60	90	60	60	60
Low	15	15	15	10	30
High	360	480	90	210	250

Source: Case manager surveys

Reduced Costs

We initially projected that cost savings would occur in three areas due to the implementation of HCR and HCATT systems: 1) making referrals to agencies, 2) agency reporting and invoicing, 3) monitoring agency performance. The only successful reduction in costs that could be documented during the timeline of the evaluation was the *cost savings associated with case managers referring to home care agencies*. Based on Table 2 above, our conservative estimate is a savings of 40 minutes of case manager time per referral when using HCR. Assuming an average of 60 referrals per month (Table 3), 720 referrals per year times 40 minutes equals 480 hours saved per year which translates to almost .25 FTE.

Table 3. Referrals to home care agencies between 1/2000 and 1/2002

Agency	Number of referrals
Amicable	176
Amstars Health, Inc.	45
Armstrong Uniserve, Inc.	143
CCSWW/LTC	226
Chesterfield Health Services	243
Corinthians Home Care	7
Elite Home Care	18
Fremont Home Care	70
Kin On Home Care	4
Millennia Healthcare, Inc.	82
On Your Own, Inc.	30
Professional Choice	83
Sea Mar	120
SoundCare	62
St. Jude HealthCare, Inc.	89
Visiting Nurse Services	134
Total referrals	**1533**
Average referrals per month	**61**

Source: Home Care Referral Performance Database

We will not be able to fully realize the cost savings associated with agency reporting and invoicing and monitoring agency performance until the HCATT system has been in place for a year and is connected with the ADS Home Care Billing database. Once HCATT data automatically download into the Home Care Billing database, we project that ADS

finance staff time to complete billing will be reduced from the baseline time of 67 hours per month to 20 hours per month. This translates to approximately 564 hours per year (47 hours/month * 12) or .25 FTE. The projected time savings for agency invoicing will also not be realized until HCATT data are downloaded into the Home Care billing database.

We will not be able to quantify the reduction in ADS costs to track, analyze, and compare home care provider performance until all languages are fully implemented in HCATT. Agencies with workers whose first language is Ukrainian, Cantonese, Korean, Spanish, or Amharic will be fully operational after the IVR script is translated in all languages by year end.

Improved quality of service

The evaluation planned to use three approaches to measure quality of service: 1) timely start of service, 2) greater percentage of authorized services actually provided, and 3) consistency and dependability of service. We dropped the measure related to authorized services due to a change in the home care billing database. We are unable to document the consistency and dependability of service until the HCATT system is in place for a year and all limited English speaking workers are on board.

The quality of service measure that did show improvement was *reducing the time between the referral and the initial start of services to the client*. Surveys of case managers in 1999 show approximately three-fifths (59.3%) of case managers reported that it took 6 days or less from the time they made a referral to service startup (Table 3). The 2000 surveys show no improvement. However, the 2001 survey results show a marked improvement in the proportion of case managers reporting an average of 1-2 days for service startup (21.4% in 2001 vs. 1.7% in 1999 and 0% in 2000). The proportion reporting service startup of 6 days or less remained fairly constant (57.1%). The biggest gains were seen in 2002 when over four fifths (82.5%)of case managers reported service startup times of 6 days or less.

Table 3. Time for service startup 1999 - 2002

	1999	2000	2001	2002
On average, how much calendar time does it take from the time you make a referral to start-up of service?	N=62	N=59	N=13	N=27
1-2 days	1.7%	0.0%	21.4%	18.5%
3-6 days	57.6%	57.6%	35.7%	66.7%
7-14 days	40.7%	27.1%	21.4%	3.7%
More than 14 days	1.7%	11.9%	7.1%	3.7%
Other	1.7%	3.4%	7.1%	7.4%
n/a	1.7%	0.0%	0.0%	0.0%

Increased accountability

To measure improvements in accountability we asked case managers and ADS staff whether or not they used performance profile information to make decisions. We also compared changes in pre- and post-implementation market share data with referral acceptance rates across agencies.

ADS contract staff and managers

In two focus group discussions ADS contract specialists indicated that the home care referral system has made it easier for them to get information about agencies that are doing a good job of filling requests for referrals. They access a real-time referral report on line as needed. It is now possible to see trends in agency performance for placing workers in homes. Performance can be compared across agencies as well. HCR tracks acceptance and denial rates and lists reasons for denial. In addition, HCR includes an online communication form for case managers to use to report issues they have with home care agencies to the contract specialist. The contract specialists can print out a report of issues reported throughout the year and include them in annual agency assessments.

So far the contract specialists use HCATT call reports (Table 4) to track the compliance of the home care agencies with the HCATT implementation schedule. The call data reports show the number of aides utilizing the system and the number of calls made per month.

Table 4. HCATT Call Data

AgencyName	# of Aides Using HCATT**	# of Active Aides	% of Aides Using HCATT	# of June Calls	# of Calls in a week (June)	Total Calls to Date
Chesterfield	151	354	42.7%	1,323	339	6,553
Amicable	103	206	50.0%	1,066	260	4,881
Armstrong	45	393	11.5%	611	159	2,617
Sea Mar	50	168	29.8%	484	109	3,343
Millennia	42	60	70.0%	418	97	1,506
St. Jude	30	49	61.2%	285	72	1,580
Soundcare	29	69	42.0%	240	63	813
VNS	23	165	13.9%	228	53	1,152
Amstars	3	46	6.5%	21	6	193
On Your Own	1	17	5.9%	8	2	10
Corinthians	1	11	9.1%	1	-	2
	478	1,538	31.1%	4,685	1,160	22,650

Source: HCATT database

ADS staff use the homecare referral reports to see how various agencies are performing. They use the market trend analysis reports to see how different agencies serve clients over time. Table 5 shows the market trends from 1999 through 2002. There has been a continuing trend that shows a shift toward more referrals going to smaller agencies than under the old system. The ADS Division Director uses homecare referral and home care billing trend data reports a couple of times a month. She uses the data at the Area Agency Directors Association meetings and when meeting with home care directors. She needs this information about trends in home care because the program is one of the most important programs in the aging and disability system. The director has been able to make better policy decisions because of access to performance information.

ADS managers indicate that they use the home care referral reports, market share trend reports, and the HCATT call data reports to brief the Advisory Council, Sponsors, City Council and other external stakeholders who have an interest in aging and long term care.

Table 5. Change in market share of home care agencies

	Oct 1999		Mar 2000		Nov 2000		Apr 2001		Jan 2002	
	# of Clients	# of Units	# of Clients	# of Units	# of Clients	# of Units	# of Clients	# of Units	# of Clients	# of Units
Amicable Healthcare, Inc.	129	8,007	134	9,021	137	10,179	152	11,255	149	11,847
Amstars Health, Inc.			35	1,496	53	2,850	54	2,501	60	3,266
Arcadia Health Services	2	179	1	137						
Armstrong Uniserve	266	15,359	326	16,718	356	19,693	380	22,066	433	26,236
Catholic Community Services	836	34,294	683	29,153	587	25,597	523	23,054	432	20,652
Chesterfield Health Services	64	4,308	164	9,403	240	15,922	227	15,104	288	19,916
Corinthians Home Care							2	53	6	303
Elite International Home Care							46	2,642	129	7,619
Fremont Public Association	205	8,071	213	9,564	230	10,729	187	9,459	173	9,433
Kin On Homecare	41	2,929	54	3,294	61	3,509	62	3,925	66	3,593
Millenia Healthcare Inc					23	1,104	41	1,864	76	5,092
On Your Own	1	266	1	111	3	158	3	153	3	177
Professional Choice	28	2,862	24	2,414	25	1,866	27	2,091	26	2,035
Sea-Mar	358	15,702	332	15,890	307	15,100	290	15,479	257	13,668
Soundcare Home Care Services			20	1,307	50	3,311	65	3,147	56	3,868
St. Jude Healthcare	69	4,223	79	4,669	70	4,318	66	4,870	63	4,725
Triarm	106	6,513	87	4,989						
Visiting Nurse Services	13	291	8	385	9	360	8	497	14	796
Total	**2,118**	**103,004**	**2,161**	**108,551**	**2,151**	**114,696**	**2,133**	**118,160**	**2,231**	**133,226**

Source: ADS Home Care Billing database

Case Managers

Since the implementation of HCR at least 40 percent of case managers consistently indicate that easy-to-use performance data is available (an improvement from 16% at baseline (Table 6). Furthermore, at least 80 percent of case managers consistently indicate the performance data is important in making referral decisions (Table 7). Yet only 36 percent indicated at baseline and again in 2002 (with a blip up to 53% in 2001) that they use data to make referral decisions (Table 8).

Table 6. Availability of easy to use and timely performance data

	1999	2000	2001	2002
How easy is it to access accurate data on homecare agency performance?	N=62	N=60	N=14	N = 27
(a) very easy to access such data	1.7%	6.7%	28.6%	14.8%
(b) somewhat easy to access	15.0%	16.7%	28.6%	25.9%
(c) not very easy to access	46.7%	33.3%	28.6%	29.6%
(d) impossible to access	31.7%	31.7%	14.3%	0.0%
n/a	8.3%	11.7%	0.0%	29.6%

Source: Case manager surveys

Table 7. Relationship to referrals and agency performance

	1999	2000	2001	2002
Do you make more referrals to agencies that respond more quickly?	N=62	N=59	N=14	N=26
(a) yes	91.5%	84.7%	92.9%	80.8%
(b) no	5.1%	6.8%	7.1%	11.5%
(c) other	8.5%	8.5%	0.0%	7.7%

Source: Case manager surveys

Table 8. Frequency of use of data to make referral decisions

	1999	2000	2001	2002
How often do you use such data?	N=62	N=60	N=14	N=27
(a) I often use such data	13.3%	11.7%	14.3%	18.5%
(b) I sometimes use such data	23.3%	23.3%	28.6%	18.5%
(c) I seldom use such data	16.7%	18.3%	21.4%	33.3%
(d) I never use such data	45.0%	38.3%	35.7%	29.6%
n/a	5.0%	8.3%	0.0%	0.0%

Source: Case manager surveys

While the results of case manager surveys above suggest weak ties between the availability of performance data and referral decisions, the HCR and market share data point to a strengthening relationship between data and decisions (Table 9). When comparing the change in agency market share in relation to case manager home care referrals made from baseline 1999 to November 2000, Pearsons r is .375, a relatively weak relationship. However, when change in market share data is compared to home care referrals from 1999 through January 2002, Pearsons r increases to .521. Looking at the details of Table 9, you can see that Catholic Community Services accepted 16 percent of its referrals over the two-year period and experienced the biggest decrease in market share (404 clients lost from 1999 to January 2002). In contrast, the agency with the biggest gain in market share (Chesterfield with 224 clients added) had a correspondingly high acceptance rate of 51 percent.

Table 9. Relationship between agency referral acceptance rate and agency market share

	1999-Nov '00	**1999-Nov '00**	**1999-Jan'02**	**2000-Jan'02**
	Change in # of clients	Acceptance rate	Change in # of clients	Acceptance rate
Amicable Healthcare, Inc.	8.00	0.38	20.00	0.39
Armstrong Uniserve	90.00	0.14	167.00	0.29
Catholic Community Services	(249.00)	0.09	(404.00)	0.16
Chesterfield Health Services	176.00	0.34	224.00	0.51
Fremont Public Association	25.00	0.17	(32.00)	0.09
On Your Own	2.00	0.00	2.00	0.00
Professional Choice	(3.00)	0.25	(2.00)	0.16
Sea-Mar	(51.00)	0.15	(101.00)	0.10
St. Jude Healthcare	1.00	0.12	(6.00)	0.25
Visiting Nurse Services	(4.00)	0.38	1.00	0.32
Pearson Correlation		r=0.375		r=0.521

Source: Home Care Billing database and HCR performance profile data

Note: Only agencies serving clients for the entire two-year period were included in this analysis.

Until all home care aides are using HCATT, we are unable to fully analyze the impact of HCATT on accountability due to case managers ability to track home care aide performance. Surveys (Table10) indicate that over one third of case managers (between 34% and 40%) already have access to usable data related to service hours provided to their clients. (The state provides case managers with printed reports containing aggregate information about services provided to their clients each month.) Interestingly, the frequency of use to track home care aide performance (Table 11) stays around 40% to 50% across the four surveys.

Table 10. Ease of access to home care aide performance

	1999	2000	2001	2002
How easy is it to access accurate data on the performance of your client's home care aides?	N=62	N=60	N=14	N=26
(a) very easy to access such data	3.3%	5.0%	21.4%	3.8%
(b) somewhat easy to access	31.7%	26.7%	14.3%	26.9%
(c) not very easy to access	45.0%	35.0%	35.7%	26.9%
(d) impossible to access	15.0%	25.0%	28.6%	3.8%
n/a	8.3%	8.3%	0.0%	38.5%

Source: Case manager surveys

Table 11. Frequency of use of data to track home care aide performance

	1999	2000	2001	2002
How often do you use such data?	N=63	N=60	N=14	N=27
(a) I often use such data	20.0%	16.7%	21.4%	14.8%
(b) I sometimes use such data	38.3%	26.7%	28.6%	25.9%
(c) I seldom use such data	25.0%	15.0%	14.3%	18.5%
(d) I never use such data	16.7%	33.3%	35.7%	33.3%
n/a	5.0%	8.3%	0.0%	7.4%

Source: Case manager surveys

Home Care Agency Staff

Due to the delayed implementation of HCATT, we are unable at this time to document or to report on the usefulness and ease of use of HCATT data and reports from the home care agency staff and home care aide perspective. We collected baseline data from both agency staff and aides and plan to collect post-implementation data after HCATT is if full operation for a year.

Increased satisfaction

Clients reported high satisfaction with the service of their home care workers before and after the implementation of HCR. Both in 1999 and 2001 over 90 percent of clients report that home care aides always or usually show up on time and stay the whole time (Table 12 and 13). In addition, the overall client rating of home care services was very high both in 1999 and in 2001 (Table 14.) In 1999 93 percent rated their service excellent or good versus 96 percent in 2001. Because client satisfaction was so high at baseline and remained so for the subsequent survey, we decided not to survey the clients again since we would learn little from the effort.

Table 12. Timeliness of home care aides

	1999	2001
Is the home care aide on time?	Client N = 176 Provider = 219	Clients N=134 Providers = 165
Always	82%	81%
Usually	16%	9%
Seldom	2%	5%
Never	0%	0%
Other	0%	5%

Source: Client surveys
Note: Some clients have multiple providers of service

Table 13. Home care aides staying the whole time

	1999	2001
Does your home care aide stay the whole time?	Client N = 176 Provider = 219	Clients N=134 Providers = 165
Always	81%	69%
Usually	17%	24%
Seldom	.5%	2%
Never	.9%	1%
Other	.9%	4%

Source: Client surveys
Note: Some clients have multiple providers of service

Table 14. Overall home care service rating

	1999	2001
How would you rate your home care service?	Client N = 176 Provider = 218	Clients N=134 Providers = 165
Excellent	56%	61%
Good	40%	32%
Poor	3%	2%
Very Poor	0%	3%
Other	1%	1%

Source: Client surveys
Note: Some clients have multiple providers of service

Conclusion

The design and implementation of the Home Care Referral and Home Care Aide Time Tracking systems not only presented Aging and Disability Services staff with complex technical challenges, but also involved the coordination and training of hundreds of users across multiple levels of government and community-based agencies. Aging and Disability staff resources and funding streams were stretched, sometimes painfully so. The level of demands of the project presented to ADS is clearly shown in the process evaluation which documents major slippage in the HCATT timeline. On the other hand, the outcome evaluation documents promising results. All involved in the network of home care services are now able to track performance and market trends on an aggregate as well as an individual client level in order to inform decision making. Managers and line staff who use HCR are working more efficiently and with greater knowledge of results. Although we have a long way to go to get all users on board, to respond to technical problems, and to integrate HCR and HCATT with ADS billing systems, we have built a strong technical foundation with project partners who have committed to continuing support of the project. The HCR/ HCATT system will become even more critical to the expansion of a strong network of agency services as the demand for long term care at home increases with the coming age boom in future years.

Appendices